Fujitsu Laboratories’ R&D Strategy

April 13, 2007
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President
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Common global market
- Open innovation, international standards, standardization activities of major companies

Competition expanding from products to R&D
- Increasing recognition that R&D is the source of competitiveness
- National strategic policies: Japan, US, UK, Germany, France, Finland, Australia, China, Taiwan, India, etc.

R&D expenditure is increasing
- Japan: Highest level ever, 3.5% of GDP ('05)
- OECD*: 10% growth ('00-'04), 2.3% of GDP ('04)
- China*: Doubled as % of GDP, 0.6% → 1.3% ('95-'04)

Explosive growth in technology licensing market, reaching $100 billion globally* ('04)

Innovation as key to development of society, economy, corporations

* OECD Science, Technology and Industry: Outlook 2006
To Prevail in Global Competition

Demand-Pull Innovation
- Create efficiencies, lower costs
- Pursue business incubation

Strengthen Global Network
- Enhance activities of overseas labs

Enhance Collaboration with Partners
- Speed development through division of tasks

Link with IP/Standardization Activities
- Conduct IP search, standardization activities prior to starting R&D
Demand-Pull Innovation

From “Product-out” to “Market-in”

In-House Technologies

External Technologies

New Fields

Business Model

“Valley of Death”

“Darwinian Sea”

Cutting-Edge Development

Commer- cialization

Securing Profitability

From “Product-out” to “Market-in”
Strengthen Global Network

- **Europe Lab** (1993 ~ ) LSI-CAD, next-generation Internet, interconnect
- **China Labs** (1998 ~ ) Telecom systems, web info processing, system LSI
- **Europe Lab** (2001 ~ ) Next-generation telecom, biotechnology, grid computing

**Fujitsu Group Overseas Affiliates**

**Technology Marketing**

**Human Resources**

**Business Partners**

- **Europe Lab** London
- **China Labs** Beijing, Shanghai
- **Fujitsu Laboratories** Tokyo
- **US Labs** California, Maryland, Texas
- **N. American Forum (3/07)**
- **European Forum (2/06)**
- **Academia Network (11/06)**
- **Fujitsu Forum (5/06)**
Enhance Collaboration with Partners

Universities

- Japan
  - University of Tokyo
  - Tokyo Institute of Technology

- US
  - University of Maryland
  - MIT
  - University of California
  - Carnegie Mellon University

- Europe
  - Munich University of Technology
  - University of Cambridge

- China
  - Peking University
  - Shanghai Jiao Tong University

Research Institutes

- PARC
- France Telecom
- Fraunhofer Institutes

Established QD Laser Inc. (April 2006)
Main Results in FY 2006

**IT Systems/Services**

- **Web Marketing Technology**
- **Business Processes Visualization**
- **High-speed Interconnect Switch**
- **Grid Computing**
- **Ubiquitous**
  - **Electronic Paper**
  - **FPcode**
  - **Digital Watermarking**
- **H.264 Imaging System**
- **World’s Highest Performance GaN HEMT Operating at mm Wave Frequencies**
- **Organic Computing**
- **Next Generation Network**
- **Photonic**
  - **Broadband**
  - **WiMax System**
- **Wireless**
  - **3.5G (HSDPA-HSUPA)**
  - **3G-LTE (100Mbps)**
- **VPS**

**Base Technologies**

- **HDD**
- **System LSI**
- **Silicon**
- **Compound Semiconductors**
- **Environment Manufacturing**

**Networks**

- **Photonic**
  - **Broadband**
- **Wireless**
  - **10Tb/s-class Core Network**
- **3G-LTE (100Mbps)**
- **Ultra High Speed (100Mbps ~ 1 Gbps)**

**Business Platforms**

- **Requirement Modeling**
- **Grid Computing**
- **Autonomous Computing**
- **Organic Computing**
- **Peta-Scale Computing**

**Solution/Services**

- **Requirement Modeling**
- **SaaS Development Platform**
- **Adaptive System Development Platform**
- **Business System Optimization**
- **Systems that support efficient management**

**System Platforms**

- **Solution/Services**
- **Service Platforms**
- **IT Platforms**
- ** Managed / Service Network**
- **Manageable / Service Network**

**Next Generation Network**

- **World’s Highest Performance GaN HEMT Operating at mm Wave Frequencies**

**Environmental/Recycling**

- **Eco-friendly Production**
Key Themes for FY 2007

2006

- IT Systems/Services
  - Solution/Services
    - Web Info. Analysis/Visualization
  - Service Platforms
    - Requirement Modeling
  - IT Platforms

- Network
  - Broadband
    - 4G/LTE (100Mbps ~ 1 Gbps)
  - WiMAX
    - Ultra High Speed Network

- Ubiquitous
  - RFID
  - Electronic Paper
  - Intelligent Robot

- Base Technologies
  - HDD
  - System LSI
    - Digital AV (H.264 etc.)
  - Silicon Semiconductors
    - Compound Semiconductors
  - Environment Manufacturing
    - VPS

2010

- Business evaluation/Improvement
  - Business System Optimization

- SaaS
  - SaaS Development Platform

- Organic Computing
  - Self-energy autonomous technologies
  - Scale Computing

- Grid Computing

2016

- Systems that support efficient management
- Autonomous systems for non-stop IT services
- Networks that connect people, goods and services

Differentiated Technology for Systems/Devices
- Multi Biometric Authentication
- Integrated Authentication

Differentiated Blade Server Technology
- 3G-LTE (100Mbps)

Optical and Wireless Technology for Next Generation Networks
- 3.5G (HSDPA-HSUPA)
- WiMAX

New Web Services Technology
- Web 2.0

Nanotechnology
- VPS
- LCA (Life Cycle Assessment)
- Energy Recycling

Eco-friendly Production
- Robust infrastructure to support next generation IT systems
- Natural human-machine interfaces
- Robust security based on biometrics

Solution/Services
- Business evaluation/Improvement
- Business System Optimization

Service Platforms
- Requirement Modeling

IT Platforms

Network
- Broadband
- WiMAX

Ubiquitous
- RFID
- Electronic Paper
- Intelligent Robot

Base Technologies
- HDD
- System LSI
- Silicon Semiconductors
- Environment Manufacturing

Differentiated Technology for
- Multi Biometric Authentication
- Integrated Authentication

Understanding the needs and challenges of the IT and technology sectors, Fujitsu Laboratories has outlined key themes for FY 2007. These themes include the development of new web services technology, differentiated blade server technology, and optical and wireless technology for next generation networks. Additionally, the company focused on the integration of nanotechnology and advanced semiconductor technologies, along with initiatives in security, energy, and eco-friendly production. These themes reflect Fujitsu's commitment to driving innovation in IT and technology for the future.
Our Global R&D Laboratory Model for the 21st Century

Science
Einstein...
Atomic Energy, Moon Landing

Business Model
i-mode, Google, iTunes Music Store

Engineering
Edison, Bell...
Light Bulb, Telephone

CSR
(Corporate Social Responsibility)
Environment, Compliance, Quality of life

(20th Century)
Integration
(Semiconductors, Information Revolution)

21st Century Fujitsu Laboratories

Market Creation
Global Networks
Partnerships

Creating a Ubiquitous Networking World

IP, Standardization

• i-mode is a registered trademark of NTT DoCoMo, Inc.
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•rapid technological change, fluctuations in customer demand and intensifying price competition in the IT, telecommunications, and microelectronics markets in which Fujitsu competes;
•Fujitsu’s ability to dispose of non-core businesses and related assets through strategic alliances and sales on commercially reasonable terms, and the effect of realization of losses which may result from such transactions;
•uncertainty as to Fujitsu’s access to, or protection for, certain intellectual property rights;
•uncertainty as to the performance of Fujitsu’s strategic business partners;
•declines in the market prices of Japanese and foreign equity securities held by Fujitsu which could cause Fujitsu to recognize significant losses in the value of its holdings and require Fujitsu to make significant additional contributions to its pension funds in order to make up shortfalls in minimum reserve requirements resulting from such declines;
•poor operating results, inability to access financing on commercially reasonable terms, insolvency or bankruptcy of Fujitsu’s customers, any of which factors could adversely affect or preclude these customers’ ability to timely pay accounts receivables owed to Fujitsu; and
•fluctuations in rates of exchange for the yen and other currencies in which Fujitsu makes significant sales or in which Fujitsu’s assets and liabilities are denominated, particularly between the yen and the British pound and U.S. dollar, respectively.
THE POSSIBILITIES ARE INFINITE
Appendix
Overview of Fujitsu Laboratories

• Capital: 5 billion yen
• Budget: 40 billion yen
  (Fujitsu’s FY 2006 consolidated R&D expenditure: 255 billion yen)
• Employees: 1,500 in Japan,
  180 at Overseas Labs
  (US, Europe, China)
• Organization (Japan):
  7 Research Labs
  7 Centers
  1 Project Group
R&D Portfolio

- Business Unit-commissioned projects: 55%
  HQ-commissioned projects: 45%

- Development
  Research: 15%
  Advanced Research: 40%
  Common Base Technologies: 30%
  Exploratory Research: 15%

Identity of BU Using Technology

Level of Tech Development

Development Research

Complete

Common Base Technologies

Exploratory Research

Advanced Research

Clearly Known

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